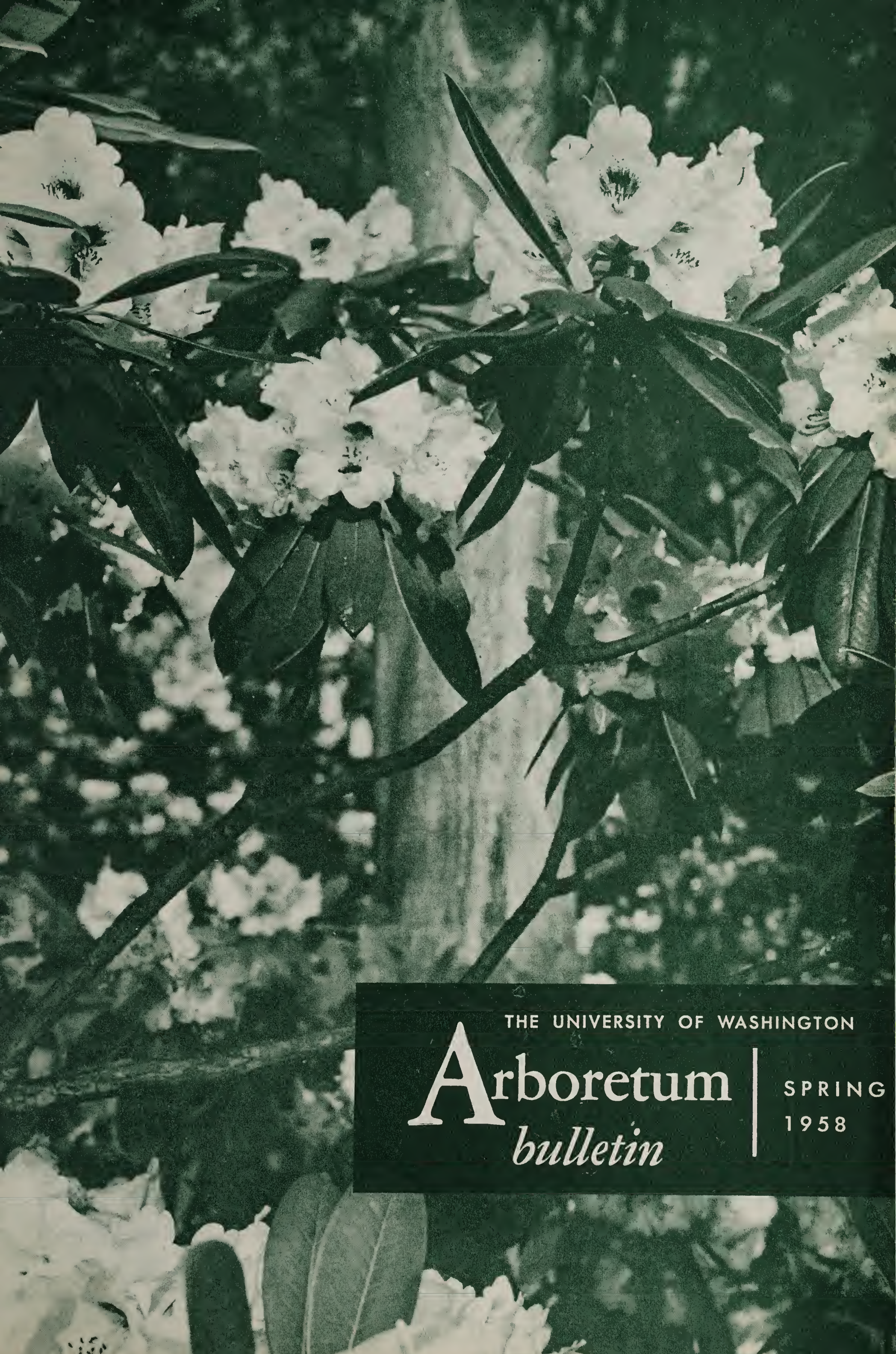

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COVER: *Rhododendron sutchuenense* var. *Geraldii*
Photo by Don Normark, March 18, 1957

Fall and Winter Plantings in the Arboretum

B. O. Mulligan

THE weather from October, 1957, to the end of January this year has been exceptionally favorable for planting; we have therefore taken advantage of such good conditions to push on with this important aspect of the Arboretum's development.

A brief summary of the weather experienced is worth recording. In October, although the month produced more rain (4.61 inches total) than the normal 2.92 inches, there were 17 dry days and no frosts. The lowest temperature was 36 degrees F. on the 20th.

November behaved in opposite fashion, being much drier than usual, with only 2.94 inches instead of 4.46 inches of rain, and 20 dry days, unusual for this month. Slight frosts occurred on five days, the lowest figure being 28 degrees F. on the 21st.

From mid-December onwards rainfall was persistent, totaling 5.13 inches, or almost the normal for this month. After the 14th only two days were dry, the 30th and 31st, and on those frosts occurred, 27 degrees F. on the latter being the coldest. So we went into the New Year with the ground thoroughly wet and the growth of plants only slightly checked.

January proved even wetter than its predecessor, with rain on 22 days totaling 8.10 inches; normal is 4.49 inches. On the 16th, 1.74 inches were recorded, the heaviest fall since November 2, 1955 (1.81 inches). No doubt this wet weather largely prevented frosts, which were only noted on four days this month, and nothing below 30 degrees F. in temperature.

Having such appropriate weather we were able to proceed steadily and systematically with moving young plants from the nursery to permanent places in the Arboretum. Some of the larger and more important plantings have been the following:

AZALEAS. 58 plants of Glenn Dale hybrids, of 13 varieties, to the bed at the north end of Azalea Way, on the west side. A group of 20 plants of another variety at the south end on the east side.

CAMELLIAS. 17 plants placed in the Camellia collection south of Rhododendron Glen (13 varieties of *C. japonica,* 4 of *C. Sasanqua).* Some of these came from the University of California, Berkeley, March, 1956. 11 forms of *C. japonica* to the Williams Memorial garden, chiefly young plants purchased in December, 1955, with funds from the sponsoring Amateur Gardeners.

CHERRIES. 17 plants of ten kinds, along Azalea Way, to replace some of those killed by cold in November, 1955. Groups of "Akebono" and "Shogetsu" and single plants of "Hizakura," "Hillieri" and *Sargentii* are among them.

CONIFERS. Chiefly junipers, firs, spruces and a few pines, numbering 74 plants of 37 kinds. Most of the junipers are on the bank south of the cottage, east of the Madison Street entrance; the firs in the new Euonymus collection, down the hillside west of the hollies.

HEATHERS. On the bank by the parking area at the head of Rhododendron Glen, 90 plants of three spring and summer blooming kinds, including "Dawn." Along Azalea Way, on the east side south of Woodland Garden, 200 plants of four kinds (50 of each), also for summer effect.

HOLLIES. 24 plants have been added to the collection, of which seven are forms of *Ilex Aquifolium,* the remainder representing five other species of which three are deciduous, *I. geniculata, I. macropoda* and *I. serrata,* and all native to Japan.

LILACS. The first groups have been planted in the new location on the hillside below the Euonymus, which can also be reached from the south end of Azalea Way. These are all species, or interspecific hybrids—13 plants of seven kinds were taken from the nursery, and single plants of eight others moved from

(Continued on Page 22)

Hamamelidaceae

Beth Gilley Malmo*

THIS family contains most interesting members with wide appeal to the botanist, to the practical gardener looking for early blossoming plant material and to the homemaker anxious for cut flowers when winter chill is still in the air. At the growing season's end many of the Hamamelis family don gorgeous hues of yellow, orange and crimson before dropping their leaves for winter. In this group we find the well-known witch-hazels which bloom in mid-winter, the Corylopsis from Asia which wreathes itself in spring in soft yellow, the Liquidambar, both Oriental and American, the Fothergilla of our southeastern states, and several other lesser known and less important members to which reference will be made later.

*We are sure this will be a most welcome subject to our readers, as handled in her inimitable style by Mrs. Malmo of the Editorial staff.

The Winter Garden area in the Arboretum is a fascinating spot. Here is growing the Hamamelis genus, the witch-hazels, about six species of deciduous shrubs or small trees, truly winter-blooming. These can be striking objects in the wintry landscape with their bright yellow flowers on leafless branches. The curious slender strap-shaped petals are uninjured even at zero temperatures. The seeds when ripe are shining black and are shot out forcefully to a considerable distance. They take two years to germinate. Their autumn foliage turns bright yellow, orange or purple, making a beautiful blaze of color in the waning season. These witch-hazels like a rich light moist loam with peat or leaf mold and the Asian species appreciate more sun

Below:

Fothergilla monticola flowering in Woodland Garden late May

(Fig. 1) PHOTO BY E. F. MARTEN

than our native North American species seem to need.

Perhaps the showiest of this genus and certainly the earliest is *Hamamelis mollis* from China, the "Chinese witch-hazel." This is a shrub to eight feet or so. By the second week of January the starkly naked branches are thickly set with rich golden orange pompons half the size of golf balls, making a glowing spot of color from a distance. A few large last year's leaves, brown and crisp, still adhere to the bush, making a pleasing symphony of the old with the new. A closer examination of the flower reveals the very narrow crumpled yellow petals thinly grouped around a maroon-colored calyx. The flower has a delightful fragrance. In the autumn the foliage turns a beautiful golden yellow. Little pruning is needed but if one likes formal effects *H. mollis* may be grown as a standard and is quite striking when so used. This is by far the handsomest of the witch-hazels. The variety *pallida* has blossoms of a paler yellow.

H. japonica, from Japan, contains three varieties, of which *H. j. arborea* is actually a small tree to 15 feet or more, reminding one of a small peach tree in form, with widely spreading branches. The blossoms are more subdued in color than *H. mollis,* from a distance appearing to be a rather dull deep chartreuse-yellow. This was beginning to bloom on leafless twigs on January 14 in the Winter Garden. Close examination of the faintly fragrant blossom reveals the calyx is deep purple inside. The stamens also are purple, against which the thin, yellow, narrow, curly petals make an interesting contrast. Charming as is any leafless tree blossoming in midwinter, this does not have the brilliant accent of color made by the earlier blooming *H. mollis.*

H. j. Zuccariniana is also tree-like in form but of more upright habit than *arborea,* and smaller-flowered with petals of pale lemon-yellow above a greenish calyx. The flowers bloom three weeks or more later than the other *H. japonica* varieties. This was in tight and prolific bud on January 14 when *H. mollis* was in full bloom.

H. j. flavo-purpurascens differs from most of the rest of this group in coloring: the petals are reddish towards the base and the calyx is purple. The small blossoms in themselves are not showy but a good form well placed can be a much-admired object when blooming in mid-winter. The delicate petals of all these early blooming Hamamelis seem to withstand temperatures down to zero without injury.

Two members of the Hamamelis genus are native Americans, *H. vernalis* and *H. virginiana.*

H. vernalis, hailing from Missouri south to Louisiana and west to Oklahoma, is a suckering upright shrub to six feet. This is the Spring witch-hazel which is still in tight bud when the winter blossoms of *H. mollis* are full and *H. j. arborea* is just beginning. The yellow flowers have a dark red calyx. This witch-hazel is not so showy as many others but the blossoms are delightfully fragrant. The Arboretum has two different varieties not widely grown, namely *carnea* and *purpurea.*

The other native American, *H. virginiana,* a shrub or small tree to twelve feet or more, found from Canada to Florida and west to Nebraska and Texas, distinguishes itself from the other witch-hazels by opening its yellow flowers in autumn when they are usually hidden by the foliage which turns an outstanding and brilliant yellow. The bark and leaves are the source of Bay Rum. This species is frequently used for grafting stock. The variety *rubescens* has reddish petals with large leaves which also turn brilliant yellow in autumn. As these are falling the rather inconspicuous half-hidden flowers open and exhale a heavy fragrance.

H. macrophylla is a closely related species from the same general area.

Another large genus in this family of *Hamamelidaceae* is CORYLOPSIS, a name which means "like the hazel," alluding to habits of growth and the similarity of the leaves. These are ornamental deciduous spreading shrubs,

natives of Asia, easily grown in a light, loamy soil. The handsome deeply-veined leaves, more or less cordate, make the shrubs interesting even when not in flower. The blossoms, charming in their soft fragrant beauty, are profuse and early on leafless branches.

One of the best is the Japanese *C. spicata,* a hardy deciduous shrub to six feet with silky young shoots and woolly leaf-veins and stalks. The fragrant, bright to deep yellow flowers, are profusely produced, 6 to 12 on drooping spikes 1 - 1½ inches long, and are very handsome in early spring, often at their best in late March. This species has larger and more handsome foliage than the one described below, and the flowers, more freely produced, are deeper colored in longer racemes. An excellent species.

Frequently seen about Seattle is the Japanese *C. pauciflora,* the Winter Hazel. This is a delightful shrub, spreading ultimately to six feet, differing from all others in this genus by its flowers, which are large and wide open, about ¾ inch across, produced in clusters of two and three on short spikes. Although these blossoms are more beautiful than in *C. spicata* described above, they are not so freely produced. The sprays of soft yellow blossoms may be cut from late February through March, depending on the season. They are delightful by themselves or may be arranged with the rosy lavender *Rhododendron mucronulatum,* in bloom at the same time. The foliage of this species, and perhaps of some of the others, has bronzy tints in summer. This is beautiful cut for bouquets.

C. Griffithii is closely related to *C. spicata* with even larger leaves and longer racemes of closely packed blossoms. This species is not as hardy as many others herein described although it is one of the most ornamental of Corylopsis.

C. glabrescens, one of the hardiest species, is from Japan. This makes a shrub or small tree to 18 feet, with the usual deeply-veined leaves and yellow fragrant flowers with longer petals than in the type, on pendent short spikes in April. This does not have the ornamental value attributed to several others in this genus.

C. sinensis will grow up to 15 feet, a really large shrub or small tree. The lemon-yellow fragrant flowers are thickly clustered, 12 to 18 on pendulous spikes 1 - 2 inches long, and come in April. Like *C. spicata* this hardy species has woolly veins on the young leaves, but first arrived from central and west China in 1901.

Another Corylopsis native to central China is *C. Veitchiana,* growing to six feet. The new shoots of this species are definitely reddish. The fragrant, spoon-shaped primrose-yellow flowers have red-brown anthers and are crowded in April on drooping spikes 1 - 1½ inches long, resembling somewhat the form of the pendulous inflorescence of our native *Acer macrophyllum.*

C. platypetala, another central Chinese shrub of six to nine feet, is perhaps less showy than some of the other species named but follows the general pattern of the group with its interesting, deeply-veined leaves and pale primrose-yellow fragrant flowers with broad spoon-shaped petals in April, on short 2 - 3 inch spikes. This was still in fat brown buds in mid-January when *H. mollis* was in full bloom. The variety *levis* to the casual eye is not noticeably different.

C. Willmottiae from West China is a shrub to 12 feet and varies from all others in this genus in that its winter buds are pale and shining green instead of dull brown. The fragrant soft yellow flowers have spoon-shaped petals with yellow anthers and are arranged rather thickly, 20 or so, on 2 - 3 inch spikes in April.

C. Wilsonii is a shrub or small tree to 15 feet from central China. Spring brings forth its pale yellow flowers in spikes of 2 - 3 inches.

C. yunnanensis is a little taller than the last, a shrub or small tree to 20 feet, with young shoots which are purplish. In April the flowers are pale to orange-yellow and are densely set in spikes 1 - 1½ inches long.

The genus FOTHERGILLA, the witch-alders, brings us back to the United States and con-

sists of deciduous shrubs all of which are found in the southeastern part of our country. They are very near to the witch-hazels. However, the inflorescence of Fothergilla is quite different, being without petals, and having 24 stamens in each flower. In this case the blossom's sole beauty is the round or oblong brush of thickly set stamens, reminding one of the bottle brush.

F. Gardeni is a low deciduous shrub to 3 feet or so with upright slender spreading branches and is found from Virginia to Georgia. The flowers, without petals, are conspicuous and consist of white stamens in cylindrical terminal spikes in April and May when they are pretty and fragrant. The foliage turns a beautiful crimson before falling. This differs from the following in its much smaller stature and much smaller inflorescence.

F. major is a most charming upright ornamental shrub of pyramidal or rounded habit, to ten feet, found from Virginia to South Carolina. It is very conspicuous in May with its numerous erect, cylindrical two-inch spikes of fragrant white brush-like stamens. In the autumn the leaves turn orange-yellow. This species is superior in every way to the shrub described above.

F. parvifolia is a smaller species closely related to *F. Gardeni* but with leaves slightly different in shape, these being more heart-shaped. This is found from North Carolina to Florida.

F. monticola, a deciduous shrub to six feet, found from North Carolina to Alabama, is very similar to *F. major* but is of more open and spreading habit. The rather large, erect 1 - 2 inch spikes of flowers follow the usual pattern and are white and brush-like without petals. The leaves in autumn turn red. This species is fully as ornamental as *F. major* and grows equally well (fig. 1).

LIQUIDAMBAR: This word comes from the Latin *liquidus,* fluid, and the Arabic *ambar,* amber, and refers to the fragrant resin exuding from the bark of *L. orientalis,* a species closely related to the native Sweet Gum *(L. Styraciflua).* The leaves of this genus bear a close resemblance to the maples, but the distinguishing feature is the arrangement; the Liquidambar leaves grow alternately, while those of the maple are opposite.

L. orientalis is rare in cultivation and of slow growth, although in its native Asia Minor it may reach 100 feet*. As stated above, from the inner bark comes a soft fragrant resin, "liquid storax," which has medicinal properties said to be valuable in treating bronchial infections.

L. Styraciflua, the stately Sweet Gum of our eastern United States, is a handsome pyramidal symmetrical tree to 100 feet or more. Its name derives from the fragrant resin which is known as "sweet gum." This tree is probably the best known and most useful species of this genus. Its leaves are maple-like and turn beautiful shades of crimson and orange in autumn. As a winter specimen the tree is conspicuous by its deeply furrowed bark on the trunk, by its corky younger branches and pendulous globular fruits which persist throughout the winter. Commercially its wood, although not of first quality, is used in furniture making and is called "satin walnut."

L. formosana is from China and Formosa where it grows to 80 feet and is similar in habit to *L. styraciflua.* This tree is not reliably hardy in our area, although very successful around San Francisco. In its native habitat the timber is used for making chests for exporting tea. Its variety *monticola,* from western China, differs very little but may be a hardier tree.

The following seven genera are not particularly well known in our area:

Loropetalum chinense (from *loron,* thong, *petalon,* petal; the petals are long and narrow.) A twiggy evergreen shrub from China growing to six feet with crooked wiry branchlets. The flowers, which resemble those of witch-hazel, are white, 3 - 6 in a crowded terminal head in February and March. This

(Continued on Page 30)

*Reintroduced here from Turkey in 1952, through seeds received and distributed by Dr. F. G. Meyer of the Missouri Bot. Gdn., St. Louis.

The Shrubby Penstemons

JEAN G. WITT*

AMONG the very best of our Northwest native flowering plants for the rock garden are the shrubby Penstemons belonging to the section *Dasanthera*. Their large, rose to blue-purple, foxglove-like flowers brighten coastal gardens in mid-May and draw exclamations from tourists in the high Cascades and northern Rockies into late summer. They are much admired for their attractive evergreen foliage throughout the year.

The shrubby species of *Penstemon* are widely variable and natural hybridization tends to occur where ranges overlap—a situation which causes confusion for the taxonomist trying to classify them, but favors the gardener who is more interested in their decorative value than in exact identification. Abrams' *Flora of the Pacific States,* Vol. III, (1951) recognizes six species and a number of subspecies out of the many that have been described. A seventh species, *ellipticus,* is found in the Glacier Park region of Montana. This section also includes *montanus,* of similar appearance, but not shrubby, from the mountains of Idaho and Montana. If the gardener is fortunate in his purchased plant material, the species will be clear cut and their differences obvious. When he goes out into the mountains to collect his own he may find them less distinct, but no less intriguing.

P. fruticosus is the most widespread of these Penstemons. It occurs east of the crest of the Cascades in Washington and Oregon, eastward into Montana and Wyoming, northward into Canada. It is the tallest of the species, forming dense clumps from 4″ to 15″ tall and a foot or more across. The shining green leaves are long and narrowly elliptical, with few to many teeth, or none. Racemes of bright lavender-blue flowers, each up to 1½″ long, are borne well above the foliage; in good forms they may be so numerous that the plant is a mound of color. This is an extremely variable species, both in size and shape of the plant, and in the amount of toothing of the leaves. The best garden variation which I have at present belongs to subspecies *Scouleri,* native to northeastern Washington, northern Idaho, and British Columbia. The flowers are nearly two inches long, and the leaves turn a rich purplish green in the winter. Herbarium sheets suggest that subspecies *serratus,* a low, very shrubby form with prominently toothed leaves from the Blue Mountains, Wallowas, and western Idaho would be an interesting garden subject; however, it does not seem to be in cultivation at present. *Fruticosus* from the Cascades can be found in many attractive leaf types. The flowers are less variable than the leaves; but besides the usual lavender, clones have been described with white, pink, soft blue, and dark blue flowers. A flesh-pink form named "Mrs. Rutherford" has been offered for sale; also one with ivory flowers called *albus,* and a bluish one known as "Azure."

P. Barrettae, restricted to the basalt cliffs and talus of the Columbia River Gap in Washington and Oregon, is the least-widespread of the species, and also one of the most distinctive. It forms wide dense clumps, often several feet across, with large, glaucous, oval to elliptic toothed leaves, and many bloom stalks of lilac or rose purple flowers up to 1½″ long. One clone which is in cultivation around Seattle has flowers more orchid than lavender, and leaves only slightly glaucous with a good deal of red color, especially in the young shoots. Plants which we found growing on basalt cliffs in Klickitat Co., Washington, were all heavily glaucous with lavender flowers on the bluish side. This species is much admired for the grayish-green effect of the foliage. Seedlings are reported to be without the characteristic finish at first.

P. Cardwellii is found west of the crest of

*Mrs. J. A. Witt, wife of our Assistant Director, was trained in systematic botany. She is a member of the American Penstemon Society.

the Cascades from Skamania County, Washington, to Josephine and Curry Counties in Oregon. It forms wide clumps from 4″ to 12″ high. Herbarium sheets suggest that in general the herbage is much less erect than that of *fruticosus,* with which it is easily confused, and from which it differs chiefly in geographical distribution. The form which I have in my garden is quite distinct from *fruticosus;* the leaves are rounded at the tip, and the teeth are rounded. Leaves on a single shoot all tend to lie in the same plane, giving them the appearance of occurring in flattened rosettes. The bright lilac-purple flowers, though much the same color as those of *fruticosus,* are borne in more one-sided racemes; the inflorescence often has conspicuous bracts and may be glandular pubescent.

Below:

Penstemon rupicola flowering on wall behind greenhouses early June

(Fig. 2) PHOTO BY E. F. MARTEN

A white-flowered form is also in cultivation.

P. Newberryi, sometimes called Mountain Pride, is the only one of the shrubby Penstemons which seems to have a real common name. It occurs in California in the high Sierras from Mt. Shasta to Tulare County and in adjacent Nevada. The creeping, woody stems form mats 6 to 12 inches high. The leathery leaves are elliptic to ovate, blunt, and toothed. The flowers are about 1¼ inches long, rather narrow, and occur in varying shades from rose-red to deep crimson. This is the reddest of the shrubbies, sometimes even having red stems and red-edged leaves. It is also the longest blooming, continuing until frost in warm localities. Subspecies *Berryi,* which extends into Oregon, has larger flowers, wider and more open.

P. rupicola is found on both slopes of the high Cascades from central Washington to northernmost California. Northwesterners,

delighted by its gorgeous mats spilling over the cliffs below Chinook Pass, find it hard to believe that Reginald Farrer once described it as having "baggy bugles of a ferocious aniline red-mauve," for surely it is one of the most beautiful of our alpine wild flowers. It grows in depressed mats, the flowering stems usually less than 4 inches high, the racemes relatively few-flowered, but often so numerous as nearly to obscure the foliage in the mass of blooms. The small leaves are elliptic to orbicular, usually glaucous, and toothed. The flowers are typically a deep rose color, but light pink and white-flowered forms are in cultivation. The white-flowered form is particularly attractive, the flowers numerous and sparkling-white, and the foliage a pleasing light apple green. The white-flowered form is a vigorous grower; the pink one somewhat less so (fig. 2).

P. Menziesii in its typical form occurs in the high mountains from the north coast of British Columbia south through the Cascades and coastal ranges to Kittitas and Lewis Counties, Washington. It grows in extensive creeping mats, and has small elliptic to orbicular toothed green leaves. The racemes are few flowered, the flowering stems less than 4 inches high. The flowers are characteristically a rich purple-violet, but may vary to lavender, pink, and blue. A white-flowered form is now in cultivation. The colorful carpets of this species which formerly decorated Snoqualmie Pass have to some extent disappeared with the widening of the highway. Subspecies *Davidsonii* is a variation having all its leaves entire and shaped like little ping-pong paddles, which occurs from Mt. Rainier southward to Tulare County, California. Subspecies *Thompsonii* with larger and coarser mats and flower stems up to 6 inches tall occurs east of the crest of the Cascades from Okanogan County to Kittitas County, Washington, and approaches *fruticosus* in appearance. *Menziesii* forms from the Olympics sometimes have tiny leaves 1/8 inch long or less. One of these is sold under the trade name of *serpyllifolius,* but the flowers seem too large for the tiny leaves. This form apparently does not come true to type from seed.

P. ellipticus, from the Montana Rockies and adjacent Canada is familiar as one of the plants which give the splashes of purple color on Logan Pass in Glacier National Park. It resembles *fruticosus* in having toothed leaves and purple flowers, but herbarium sheets suggest that the plant is smaller and somewhat more delicate than typical *fruticosus;* other variations approach *Menziesii* in appearance.

In addition to the wild species, a number of interspecific hybrids are known, some of which are in cultivation.

Newberryi x *Davidsonii* hybrids have been described from the Sierra Nevada.

Rupicola hybrids with *fruticosus* and *Menziesii* are known from the central Washington Cascades.

Barrettae x *fruticosus* hybrids have been known to occur in gardens where the two species are grown together.

X *Edithae,* the only deliberately planned hybrid, was raised by Mr. Carl S. English, Jr., of Seattle to combine the color of *rupicola* with the larger plant of *Barrettae.* It forms large clumps of somewhat glaucous bronzy foliage, beautifully red in the spring, and bears masses of brilliant magenta-purple flowers.

"Six Hills Hybrid," variously given as *rupicola* x *? Newberryi* or *rupicola* x *? fruticosus,* has rosy-lilac flowers and dark green leaves, bronzy red on the underside.

The shrubby Penstemons as a group are at their best in the gardens of their native Northwest. They are also reported as performing satisfactorily in the Northeastern states. In other parts of the United States, however, they do less well, to downright poorly in the Central states where climate and soils do not seem to be to their liking.

Their chief requirement seems to be a well-drained, sunny location—not surprising when one remembers that their native habitats are so often cliffs and talus slopes. They do not grow well in places where the soil can become waterlogged. They require no special care

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Bog Gardens

FRANCES KINNE ROBERSON*

"Where the Reeds and Rushes Quiver"

—JEAN INGELOW

BOG GARDENING, more often than not, is either a necessity or an accident in landscaping. Sometimes a home owner discovers that some part of his ground is too wet or too soggy for customary gardening. He can philosophize that "nature made her what she is" and capitalize on that fact by selecting for it those plants which respond well with wet feet. Some fortunate people have streams meandering through their property. Brookside plantings are usually made up of moisture-loving plants. Lake margins need the same kind of material. Occasionally an artificial pool, which has outlived its usefulness or has become a hazard to children, is transformed into an interesting bog. Out of all these situations, and others, there emerges an occasional artistic and well-planned bog garden. It is our purpose here to suggest plants and ideas which, when used, would produce pleasing results in still more cases.

Stream banks most often lend themselves to perennial plantings. Low ground covers make a good foreground for taller perennials or shrubs. *Ajuga reptans rubra,* with its bronze leaves and purple flowers, *Ajuga genevensis* with greener leaves and blue flowers, and the variegated form of Bugle all prove as adaptable to wet situations as they do to many other problem spots. The butter-yellow flowers of Moneywort — *Lysimachia nummularia* — and its mats of light green foliage make a good carpet. *Nierembergia rivularis* also has showy flowers, but of white, and the leaves are blue-green. The latter is commonly called Queencups.

Plants of medium height or between medium and low would include Ladyslippers. Best known are *Cypripedium reginae (spectabile)* with white sepals and rose-pink pouch of large size; *acaule,* whose solitary flower has a deeper rose or rose-purple flower, and *montanum,* with brownish flowers with white sacs. This group would also include Marsh Marigold, either the western white one—*Caltha leptosepala*—or the eastern yellow one—*Caltha palustris;* Water Forget-me-not—*Myosotis palustris; Corydalis lutea* with its spurred flowers of yellow; *Mimulus Lewisii* with bright rose flowers, or *Mimulus moschatus* or *M. Suksdorfii* having yellow blossoms; feathery-flowered *Astilbe chinensis* in white, pink, rose or red; Columbine, in any of the long-spurred varieties, whose teetering flowers look like multi-colored birds on slender twigs; Blue-eyed Grass, either *Sisyrinchium angustifolium* or *S. bellum;* and Globe Flower or *Trollius* in many varieties.

Best known, as we progress to taller plants, probably is *Iris pseudacorus* with its flat yellow flowers. Another water iris is *I. versicolor,* but some others which like moisture part of the year behave poorly when the root-drenching is year round. *Chrysanthemum lacustre* is a good white daisy from Portugal for our list. *Chelone glabra,* with white flowers tinged rose, and *Chelone obliqua* with deep rose flowers represent the Turtleheads. The Daylilies *(Hemerocallis)* have the advantage of being able to compete successfully for a place in the sun. The large flowers are a fine contribution. Plantain lily *(Hosta* or *Funkia)* makes a good plant for the shady bog.

No finer association of moisture-loving plants can be found than that which carpets mountain stream banks in the Northwestern United States, in the plant zone known as Canadian. The deep green, much-cut leaves of *Coptis laciniata,* or Goldthread, appear more fern-like than the flatly pressed fronds of *Struthiopteris spicant,* or Deerfern, among whose fine black roots the coarser yellow ones of the *Coptis* thread their way. There may

*Mrs. (L. N.) Roberson of the Editorial Board has most certainly first-hand knowledge of her subject since she grows many of these plants in her own Seattle nursery.

appear the heavily-veined whorls of leaves which top the 6- to 8-inch high stems of *Cornus canadensis* (Bunchberry), and emphasize the beauty of the miniature Dogwood blossoms and, later, the bright red berries. *Clintonia uniflora* with its flat strap-like basal leaves frequently invades such crowded areas, although a more typical setting for it is in dense enough shade that the forest floor is covered with decayed vegetation only sparsely set with small plants. Fortunate is he who finds intact the deep blue berry which follows the single pure white flower of this *Clintonia*.

All of these plants adapt themselves to a cultivated bog of slight to medium moisture content. So, too, do trilliums and various members of the Saxifrage family such as *Parnassia intermedia* (Grass of Parnassus), *Mitella trifida* (Mitrewort), *Tolmiea Menziesii* (Piggy-back plant or Youth-on-Age), and *Tellima grandiflora* (Fringe-cup).

Another typical association of bog-loving plants in the Puget Sound area is repeated thousands of times. Trees of considerable size—such as red alder, western hemlock and broad-leaved maple—may tower over a thicket of the forbidding Devil's Club *(Oplopanax horridum)*, Vine Maple *(Acer circinatum)*, Salmonberry *(Rubus spectabilis)*, and red-berried Elder *(Sambucus callicarpa)*. The ground area under these large plants is usually carpeted with Vanilla Leaf *(Achlys triphylla)*, Oak Fern, Maidenhair Fern, and/or such members of *Saxifragaceae* as have been mentioned.

The restful effect of a planting patterned after this face of nature lulls us to calm satisfaction with an ever more crowded but self-sufficient bog based primarily on a display of greens and browns. A good antidote for a surfeit of green is contained in seed packets of bright-hued annuals and perennials. These may be started in pots or flats and re-set when large enough to transplant. In some cases it is wiser to purchase plants if faster effect is desired.

The Primrose family can contribute greatly when color is in demand. Primulas from far places, planted in drifts, supply multi-hued clouds of bloom over a long period of time. Early in spring the tight balls of *Primula cashmeriana* introduce various shades of lilac or violet. Rare but worth hunting are the white and crimson flowered forms. The height varies with conditions but is usually between 12 and 20 inches.

A much taller flower stem occurs in some of the later season Primulas, such as *P. sikkimensis* from the Himalayan state its name commemorates. *Primula helodoxa* and *P. Florindae* are other tall-stemmed ones which are usually yellow.

Primula pulverulenta, a candelabra type from Szechwan, western China, has won considerable favor by reason of the great variety of color forms such as in the Bartley Strain. Some breath-taking hybrids claim *P. pulverulenta* for one parent.

The characteristic purplish red flowers of another candelabra, *Primula japonica,* present a problem when combining colors. Some of the white or rose-colored forms blend more readily. It is mid-season (May or June) and medium in height.

The enthusiast will find many other species of Primula suitable for wet ground if he searches through seed lists. They grow readily from seed and so may be used lavishly with little expense. Most of those mentioned here will self-seed and thus perpetuate themselves.

The Primrose family offers other interesting plants than the actual primroses. One which is excellent for naturalizing in bogs must be included here. The pointed bills of Shooting Stars or Birdbills, by whatever name one calls them, thrill the early spring observer who looks for daintiness in individual flowers. Showiness is achieved by planting in colonies. Species which grow in wet ground include the lovely white-flowered *Dodecatheon dentatum,* as well as the stout rose-colored *Dodecatheon Jeffreyi.* Both are northwest natives.

A pseudo-tropical atmosphere can be created in the bog garden with large-leaved plants such as *Rheum palmatum,* not a culi-

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Newer Hybrid Lilies

C. L. Shride*

LIKE most things new, these are based on experiments made many years ago. An observant breeder, whether animals or plants are involved, soon learns that certain crosses give better results than others do. How many of you remember the rose Ophelia? By seedlings and mutations it influenced garden and greenhouse roses for many years.

There are several strains of hybrid lilies now available and I shall consider these strains briefly with some mention of the people who have made them possible.

Some early hybrids which might be considered the foundation of this work are *L.* "Parkmanii," by the great American historian, Francis Parkman, who, in 1869, produced a plant from *L. speciosum rubrum* seed pollinated by *L. auratum*. A few years later Mr. C. M. Hovey, a Boston nurseryman, made the reciprocal cross which produced a similar plant with a larger flower, but like "Parkmanii" it was soon lost.

In 1900 the Royal Botanic Gardens, Kew, produced a hybrid lily of *L. leucanthum chloraster* x *L. Henryi* parentage which resembled *L. auratum*. It was soon lost but its record led Monsieur E. Debras of Orleans, France, to try to reconstruct it. After several fruitless efforts he obtained two viable seeds in 1925, from using *L. Henryi* pollen on *L. Sargentiae*. One seedling lived and bloomed in 1928. It was named "Aurelianense"—from the old name (5th century A. D.) of its birthplace. The original stock became infected with virus disease and was destroyed, but not until after seedlings were raised both from self-pollination and back-crossing with both parents. For this reason the name "Aurelianense" (or Aurelian) now covers many divergent forms.

In 1933 Tom Barry of Lambertsville, New Jersey, crossed *L. sulphureum* and *L. Henryi* and raised a plant similar to "Aurelianense"; perhaps its flowers are darker in color and have more substance. This hybrid was named "T. A. Havemeyer." Being in short supply, some seedlings were soon marketed under the name. These have also been crossed and recrossed with the parents, sometimes injecting similar species into the complex. Some nurserymen refer to these as the "Barryi" group.

These two strains attracted much attention and many keen plantsmen were soon using them in ambitious breeding programs. They have been so mingled that the origin of a few named clones today can be traced with certainty. The plants are hardy and thrifty growers. Some, like *L. Henryi,* do not hold their heads on upright stems but they could have worse faults.

The flowers vary from tidy, close trumpets to large, loosely formed ones, in colors from cream through lemon, green-gold, yellow, orange and apricot, with so-called pinks. Others are bowl-shaped, some reflexed with large broadly recurved petals, and others of intermediate gradations. These are late July and August bloomers, when they fill a very noticeable gap in the lily parade. Carlton Yerex of Newberg, Oregon, one of the pioneer lily growers of the Northwest, was an early importer of "Aurelianense" and now devotes practically his entire farm to their production. Recently named clones are "Eventide" and "Bright Cloud." Selected strains on the market are trumpets, flares and "Corona Aurelianense" in separate colors.

Edgar L. Kline of Lake Grove, Oregon, has worked along similar lines and his Golden Harvest hybrids are cream, lemon, buff and apricot in color. He will soon introduce a new clone named "Tom Barry," a widely-expanded, rich yellow flower on strong five-foot stems.

The Oregon Bulb Farms of Gresham, Oregon, named three separate strains of Aurelians, in addition to many other lilies. Their "Golden

*Mr. Shride of Seattle has for years been successfully growing and breeding many of the American lily species.

Clarion" is one of the best yellow trumpet strains. "Sunburst" is the name applied to those flowers more resembling *L. Henryi,* although they are larger and less reflexed. "Heart's Desire" names those intermediate in form and, like "Sunburst," having a rather wide range of color. "Pink Ice" is a more recent introduction which will surely join the others in popularity when better known. These are all vigorous growers and make excellent garden subjects (fig. 3).

The Oregon Bulb Farms are the largest lily growers in the world. Under the very able direction of Jan de Graaff, there is a continuous hybridizing program with new lilies introduced to the trade each year. There is not enough space here to discuss all of the hybrid lilies originated there in the last few years, but some must be mentioned. Those of you who saw the show of the North American Lily Society in 1954 will recall the spectacular "Empress of India," which was judged best lily in the show. A sister seedling, "Empress of China," has been awarded similar honors since. These are of *L. auratum* x *L. speciosum* parentage, the "Parkmanii" strain mentioned above. They are not for sale now, as several years are required to work up a commercial stock from a single bulb.

The Mid-Century hybrids are popular garden subjects. Their *L. tigrinum - dauricum - concolor* parentage insures hardiness and vigor wherever grown. Several clones were selected from this strain of which "Enchantment" is the best known. It has upright flowers of vivid nasturtium-red. "Fireflame," with outward facing mahogany-red blooms, and "Valencia" with rich yellow blooms are other good clones of this strain. "Destiny," "Felicity" and "Prosperity" are later selections.

For the Fiesta strain Mr. de Graaff used *L. Davidii,* and characteristic plants are more colorful with reflexed blooms on four- to six-foot stems. A very dark red, the best of this strain was named "Dr. Abel."

Mr. de Graaff used several hardy trumpet lilies to make his Olympic Hybrid strain, which has largely replaced *L. regale.* (Several similar strains are on the market, as most lily growers have tried crossing *L. regale, L. Sargentiae* and *L. leucanthum.)* His latest-named strain is "Black Dragon." This was awarded best in show at the International Lily Show at Ithaca, N. Y., last July. The individual flowers are large, wide-open trumpets, white inside with very dark backs. It will be on the market next year at a moderate price.

I have mentioned the showy "Parkmanii" strain, but I know of only two that can be purchased. "Jillian Wallace," a clone from Australia, may be described as a flat-flowered red auratum. Potomac Hybrids (selected strain) are from the U. S. Dept. of Agriculture, and more resemble a giant *L. speciosum rubrum.* They are flat across the center with petals slightly recurved. Both of these are better doers than *L. auratum.*

Several Australian and New Zealand growers are working on this cross and have some selected strains and clones that will soon find their way to American gardens.

In addition to the Potomac hybrids mentioned above, the U. S. Dept. of Agriculture,

Below:

Sunburst Lilies
(Fig. 3) PHOTO BY HERMAN V. WALL

Ornamentals Division, has produced many others of this strain. The use of different forms of *L. auratum* with the pink and white varieties of *L. speciosum* has resulted in a wide variety of forms and colors. From almost red to almost white they are beautifully marked and colored. Flowers are neither as bowl-shaped as *L. auratum,* nor recurved as much as *L. speciosum.*

A few of these have been sent to growers for testing. Others will no doubt be released in the near future, and when these are made available to you they will influence American lily culture more than the Bellingham hybrids did twenty-five years ago.

Leslie Woodruff, of Harbor, Oregon, has worked with this cross, and at the 1957 show of the North American Lily Society had on display the darkest-colored of the near speciosum forms that I have seen. He named it "Black Beauty."

One may reasonably infer that the intention of the hybridizer is to produce new and better forms and colors of flowers. No less consideration should be given to garden performance. The parentage of a hybrid will usually indicate its response to climatic conditions. Our Canadian friends have rightly used the most hardy species for their crosses—lilies from Siberia and from the mountains of Europe—while we of the Puget Sound region revel in a much wider selection.

This is one of the most favored regions of the world for lilies and most of the species and varieties in cultivation thrive here. It is noticeable that, regardless of the parent stock used, many of the hybrid offspring are hardier and of easier culture than their parent species. The little success that I have had in hybridizing lilies has been mostly with Californian species. Being chiefly native to the mountains there, they are reasonably hardy. However, failure is often reported with the Californian lilies east of the Rocky Mountains. Two clones which I originated, of *L. Humboldtii - pardalinum - Parryi* parentage, have grown satisfactorily where the three parent species failed.

Ease of propagation is another factor that must guide a nurseryman's selection. To be given a clonal name, a hybrid plant must be propagated vegetatively only. If a new lily does not increase easily, it remains high priced and will not merit popularity. Fortunately, hybrid vigor influences this and most of our hybrids increase easily from scales. The Potomac hybrids will yield two to four bulblets per scale incubated, and *L. testaceum* and "F. E. Brown" do almost as well. Others including "Redbird" (Palmer) and de Graaff's "Talisman" and "Enchantment" form bulbils at the leaf axils. These may be removed in late summer and planted like peas to increase your stock of lilies.

Several Canadian hybridizers should be mentioned here. Miss Isabella Preston, in 1929, crossed *L. Davidii* var. *Willmottiae,* a vigorous plant with many reflexed red flowers, and a seedling of *L. dauricum,* which bears upward-facing flowers. From the progeny she selected seven plants which became known as the Stenographer lilies. My choice of the clones of this group are "Edna Kean," "Grace Marshall," and "Lillian Cummings," but there is no startling difference. Based on this group, Miss Preston developed some good yellow-flowered hybrids. "Coronation" was succeeded by the better "Sovereign." The fighter group includes "Corsair" and "Hurricane," both low-growing plants with a candelabrum of rich red, upward-facing blooms.

Other Canadians have used these hardy and vigorous hybrids in their work. Dr. E. F. Palmer added *L. tigrinum* to get a gorgeous group of later-blooming reds. "Redbird" is a larger and improved tiger lily. "Cherokee" and "Valiant" are lower growing with upward tilting flowers. "King William," a recent origination, was derived by Dr. Palmer from *L. croceum, hollandicum* "Mahogany," *L. tigrinum,* "Coronation" and "Brenda Watts." Mature plants bear up to forty blooms with many secondary and a few tertiary buds making it a thing of beauty for a month. "Moonbeam" and "Sundance" are recent Aurelian hybrids from the Palmer gardens.

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American Primulas

Grace T. Dowling*

PLANT explorers in America have been busily at work for many years and in their stride primulas have been discovered, generally, as in most other countries, high in mountain meadows or under overhanging cliffs. Not a great deal of effort has been made to classify this particular group and the different names given to the same plants have complicated the correct identifications in many cases.

The following list has been gathered from floras, magazine articles and reports from collectors. It is offered with no assurance that it is a complete or accurate account, but only with the hope that American primulas may tempt some appetites jaded with struggles growing European and Asiatic ones.

Many on this list I have seen growing, others I have found as specimens in herbariums and a few are only names that are interesting to hear about. In time there will, without doubt, be many more gardens featuring American primulas and, considering the time it has taken English gardeners to establish some European varieties with only comparative success, there is no reason why we cannot equal these accomplishments.

Farinosa Section

PRIMULA FARINOSA. All over the world, wherever there are spots favorable to the growth of *P. farinosa,* this little primula, in some unaccountable way, has found a home and grown contentedly. Apparently it prefers picking its own location and, more than most primulas, has difficulty settling in a garden spot deliberately made for it. The various forms of the American *P. farinosa* may not be identical with those which grow in other countries. The color may vary or the leaves may be a trifle longer or shorter, but the family characteristics are so evident it is not difficult to recognize. It has been found in Greenland, then in Maine and around Quebec. Gradually wandering across the country, it grows in high, wet, grassy meadows in Michigan, Minnesota and western Canada.

Most of the forms of *P. farinosa* are more or less covered with white meal, at least when young, and this fact alone makes it difficult to differentiate its sub-species; one, called *P. mistassinica,* is the Canadian *P. farinosa,* differing from the type in that the leaves are larger, the flowers are paler and it lacks the meal of *P. farinosa.* It is much easier to tame and stays a longer time in the garden.

PRIMULA INCANA. A little primula, so much like the type that it has been called *P. farinosa* var. *incana.* Another synonym, according to Mr. Williams (an early plant explorer) is *P. americana;* it is found in Utah, and farther north in Alberta along the Mackenzie River, then drifting down through the Rocky Mountains in Montana, Wyoming and Colorado. The rosette is a tiny thing formed of leaves one to three inches long. The undersides of the leaves are mealy and the edges are notched above the middle of the leaf. The blossoms are pale lilac, on farina-coated stems four to eight inches tall. It grows in the garden more easily than *P. farinosa.*

PRIMULA EGALIKSENSIS. Not unlike *P. sibirica* and so nearly resembling *P. farinosa* that it is often called the Greenland farinosa, *P. egaliksensis* seems almost like an old friend that is met in Northern Labrador. Without a doubt, it is one of the various forms of the "Bird's e'en" that grows in the north of England. It is smaller than the type form, being almost a dwarf with smooth, pale-green leaves without meal, from one-half to one inch long with white blossoms growing in an umbel on a stem from two to five inches tall. It likes limestone chippings in a rich, rather heavy loam in a sunny situation.

PRIMULA BOREALIS. From the Canadian Rockies, as well as from Siberia, comes

*Another of Mrs. (J. Thomas) Dowling's interesting articles on Primroses. (Candelabra Primroses, I and II—Summer and Fall—1951).

this little gem of the Farinosa section. The plant is a minute tuft of leaves, smooth and about one-half inch long, with toothed edges, and a surprisingly long flower stem, three times as long and more as the length of the leaves. The specimen in the herbarium, with its sweet, faded petals (originally probably rose or lilac) was charming and I longed to be able to bring some plants into a garden.

PRIMULA SPECUICOLA, probably a subspecies of *P. farinosa,* also grows in Utah, along the San Juan River on hillsides and bluffs under overhanging limestone cliffs. The tuft of thin leaves, from which springs the flower stem, shows signs of farina while the leaves are yet young, but as they grow older the meal disappears. The flower stem is scarcely one inch tall but it is topped by an umbel of from ten to twenty dark-violet blossoms with yellow tubes, blossoming from February to August.

PRIMULA LAURENTIANA was sent to Dr. Fernald, keeper of the Gray Herbarium at Harvard University. It came from the Laurentian Hills in the vicinity of the St. Lawrence River. As far as I can learn it follows the general pattern that *P. farinosa* has established.

PRIMULA SIBIRICA. With amazing foresight plant explorers have brought primulas into cultivation where, with good food and care, they have become affluent and outstanding. While *P. sibirica* itself has never become a plant that has caused much excitement, some of its close relations have developed latent fashions and temperaments not guessed by the original collector. Mr. Lohbrunner, a traveler and plant collector who lives in Victoria, B. C., found growing in a small river in the Yukon Territory a little primula with its feet completely covered with water. He was not particularly impressed with its beauty, but in spite of that he brought it home. It developed, with solicitude and careful nourishment, into what he called P. A. Y. Ex. No. 104, a fragrant counterpart of *P. involucrata,* deep, clear pink with a yellow eye. Not a true *P. sibirica,* but one of a group, *P. chrysopa, P. tibetica, P. involucrata* and *P. borealis,* so difficult for the amateur to separate under their respective names. The true *P. sibirica,* as its name signifies, is found in Siberia, but is also reported from the Northwest Territories where it was found by a Canadian-Arctic expedition. It has flowers that vary somewhat. Some are pale pink, without much substance and with little soul. It is only included in this meager list of primulas to show the differences in a generally fine section.

Nivalis Section

PRIMULA PARRYI. If *P. Parryi* could have arranged to belong to another and easier section than *Nivalis,* without doubt it would have run a close race for the position that *P. japonica* now holds in our gardens. One of the largest and handsomest, if not the best of all the American primulas, *P. Parryi* compares in size with the Asiatic Candelabra group and reminds one of a giant plant of shooting star *(Dodecatheon),* another genus of the *Primulaceae* family. It has a reputation of "rank-smelling" but this has been denied, and on the other hand the root is said to be fragrant. Mrs. Kathleen Marriage of Colorado Springs, Colorado, wrote of seeing a row of them in blossom, growing on a moss-covered, half-rotten log imbedded in a shallow stream. This may be a suggestion for a similar position in a garden. *P. Parryi* grows from Montana to New Mexico, from Nevada to Arizona, always high in the mountains, eight thousand to thirteen thousand feet, along banks of rocky streams running through alpine meadows. The flowers grow in a one-sided umbel of "rosy-purple" flowers, sometimes on eighteen-inch stems. It is the most common of any of the species in the Rocky Mountains and, while it is capricious and not easily tamed, it has been grown, quite successfully, by many primula growers. *P. Parryi* prefers a rich loam, rather heavy in texture, in half shade, plenty of moisture in the growing season and a dry crown during the winter months. According to some writers, *P. mucronata* and *P. m.* var *arizonica* are synonyms of *P. Parryi.*

PRIMULA ANGUSTIFOLIA. The narrow

leaves that its name describes give this primrose a dainty, rather frail look that belies its constitution. In the mountains it is a husky plant but more or less delicate when grown in a garden. *P. angustifolia* is very small with leaves which grow in a tuft only one-half to one inch long, and the flower, with scarcely any stem, is tucked among the foliage. The whole plant, without a grain of meal, is dainty and appealing. Generally, there is only one large blossom of a dark lilac shade, sometimes two, but when there are two, neither is as large as the flower on the plant that carries only one. It grows on many mountains in Colorado; Pike's Peak, Long's Peak and on the Spanish Peaks, and then south to the alpine meadows in New Mexico. It has been grown in some gardens in fibrous loam with limestone chips, in moist half-shade with a glass over it in the winter. There has been found a variety called *P. a. Helenae,* which is purple, or in some sections a white one has been found.

P. CUSICKIANA. This primula, which grows in the Wallowa Mountains, Oregon, on high alpine, rocky hillsides, is generally found before the snow disappears entirely; a tiny, three-to-six-inch flower stem over a smooth rosette of non-mealy slender leaves. After the snow is gone *P. Cusickiana* has also disappeared entirely, not to be seen until the next spring. The flower umbel consists of from two to four violet flowers and very rarely a white one is found. It has been cultivated successfully in some gardens in a half-shady place where it has good loam with plenty of leaf mold. It is very nearly related to *P. angustifolia,* which it closely resembles; in fact it has been called *P. angustifolia* var. *Cusickiana.* Some authorities place *P. Broadheadae* and *P. Broadheadae* var. *minor* in the list of synonyms given under *P. Cusickiana. P. Broadheadae* grows in Utah in marshy places about nine thousand feet high. The plant is covered with broad sheaths of faded and dried leaves. *P. B.* var. *minor* varies somewhat from the typical form in the shape of the corolla.

P. RUSBYI. Some thirty or forty years ago *P. Rusbyi* was introduced to garden cultivation. Most often it has been found in New Mexico and Arizona, on a ledge jutting out from a cliff on a side facing north. It is a handsome plant, perhaps one of the most beautiful American species. *P. Rusbyi* has leaves with notches varying in size and shape on different plants and with smooth surfaces, free from farina. The umbel of blossoms is carried on a stem six to ten inches long whose color Reginald Farrer described as "obscure purple, like an old blood stain on faded velvet." Farrer also thought it had a "certain sinister expression." It grows fairly well in shady, cool, especially prepared spots in the rock garden in good loam, peat and leafmold.

P. MAGUIREI. From northeast Utah, a close relative of *P. Cusickiana, P. Maguirei* was named for its discoverer. According to its description it has fairly thin, broadly spatulate leaves with red or purple flowers. When there is only one bloom the flower is large and conspicuous, but when more than one the flowers grow smaller as the number increases. It grows on damp, overhanging rocks in the Wasatch Mountains.

P. EXIMIA. Growing through the tundra of the Arctic regions this primula has been called by Mr. Walter Eyerdam one of the loveliest flowers in the Aleutians, and it is typical of the coastal regions of the Bering Sea. It is a large plant with smooth leaves with no meal, sometimes five inches long, broad at the tip and narrowing to a short leaf stalk. The leaves seem rather scalloped but they lack any notches. The flower stem has traces of meal at the upper end and the umbel of flowers consists of six to ten beautiful purple or purple-blue blooms. It is a rare species but has been found in the Kurile and Pribilof Islands as well as the Aleutians. When brought into cultivation it should be planted in a damp spot in half shade in a rich, somewhat heavy, fibrous loam.

P. MACCALLIANA. The herbarium specimen I saw of *P. Maccalliana* was collected

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The Fascinating Bamboos

Lowell Casey*

THERE are few places in the world where such a great range of evergreen ornamental plant material can be grown as in this area. Among these plants the ones most prized are usually most admired for their flowers, yet one plant group in this category which, properly used, can become the center of attention perhaps as much as any other, considered for its year around effect, is that woody division of the grass family, the bamboos, which rarely flower. Coming primarily from the Orient, as does the greatest share of our other choice ornamentals, and bearing in mind how bamboo constantly appears as a symbol of beauty, it would seem to behoove us to pay more attention to this remarkable plant group.

It is true, of course, that most bamboo species are tropical in origin, but, since there are several hundred species (one source says over a thousand) and some will stand zero temperature, an ample number is suited to our climate and more suited to most city gardens than the larger tropical forms. It is also true that, although not all spread by underground runners, those most adaptable here do so in varying degrees, so that usually their roots should be surrounded by a barrier of concrete, corrosion-resistant metal, or cement-asbestos board to a depth of two to four feet, depending on the soil conditions and the specific nature of the bamboo. It may be well to add that, since the larger ones grown here seem to start their new growth only in early summer, should they tend to get out of bounds, removal of unwanted new sprouts as they appear should tend to check spreading. There are many places in Seattle where a species planted apparently around forty years ago and given scant attention has never spread much.

It is perhaps well also to point out that one genus of plants commonly known here under the name bamboo is not a bamboo at all but species of *Polygonum,* belonging to the dock family. These plants are hollow-stemmed perennials from three to six or seven feet tall with large, somewhat heart-shaped leaves. Their spreading runners are capable of sending out sucker shoots every few inches and once established are one of the most difficult of all plants to eradicate. If confined they make very attractive specimens, but it is unfortunate that they have become confused in many people's understanding with bamboo.

As to their use in the garden, bamboos blend with other garden material exceptionally well, but their unusual characteristics make them most useful as accents and as such the larger types can become perhaps the most striking of anything grown in this area, creating exotic effects comparable to those seen in much warmer areas. As striking vertical accents that are at the same time airy and graceful, their only close competitor is the birches, but, unlike these latter, they are much less likely to outgrow their setting and they do not lose their bright green leaves in winter. On occasion they can be very effective free standing and alone but usually are at their best packed by a plain wall, a high solid fence or an embankment of rocks, or in a planting with an interesting grouping of mostly broad-leaved evergreen plants at their base, containing perhaps a strong sub-accent of bold texture to contrast with the bamboo. A pool in the foreground may also be very effective but the larger and woodier forms provide such a continuous fall of leaves and husks that keeping the pool clean becomes a real problem. There are smaller forms with medium to very large size leaves in palmate clusters that are exceedingly handsome and do not drop much. For best appearance the tall, woody forms require artful thinning of the lower branches as well as occasional thinning of the culms them-

*We are happy to have a first article on Bamboos in The Bulletin. Mr. Casey of Seattle is an enthusiastic amateur collector of these unusual plants.

selves, to obtain effects reminiscent of familiar Oriental illustrations.

The range of growth of the bamboo genera is truly enormous. The largest tropical forms can reach a height of well over one hundred feet; sometimes like the height of a ten-story building. The culms may be up to fifteen inches in diameter. The shortest forms are about six inches tall. Among even the largest forms, nearly all reach their full height within five or six weeks from their emergence from the ground. The speed of growth is comparatively slower at the beginning and end of this period but may be four feet per day at the height of development; the full diameter of the culm is in evidence by the time it exceeds a few inches in height. Species grown locally may push up at a rate of one to two feet per day. Even this may be understating the case, for an article published in *Sunset* magazine of May, 1943, reported that a Mr. Norris B. Stone of Oswego, Oregon, had a 3½-inch culm that grew 36 inches in 24 hours. It can readily be realized that such a growth rate requires a remarkable root system, demanding plenty of rich soil and much water. As these tall culms or canes push upward, branches at first concealed in husks just above the nodes stretch outward so that, as the tip of the cane reaches its ultimate height, all the branches have reached their approximate full spread and, as a signal of this, the first leaf appears at the highest tip of the cane. So we have a very tall, tree-like plant structure which gains its full height and breadth in a few weeks, then in a few more weeks becomes fully clothed with evergreen leaves. These leaves are replaced each season or sooner with new leaves, but, though the culm will live for five to fifteen or more years, there is no more structural growth and, though the stem usually makes a very slow change in color over a period of several years, there is no other appreciable change. Culms do require a three-year period to fully ripen, if they are to be cut for use.

Bamboos are propagated by division of clumps, which should be done in the spring, just as growth starts. Transplanting may be done also in early fall. It is best not to disturb them at other times of the year and it is reported that winter is the time they most resent disturbance. If a large species is started by means of a piece of root with one or more dormant buds, perhaps one small shoot will develop the following summer. Under favorable conditions, the new growth each year will approximately double the height of the previous year's growth until the maximum potential is reached after about fifteen years, whereas a larger division will develop much faster in keeping with circumstances. For maximum results the planting must be in deep, rich, light soil with space for roots to attain a spread equal to the ultimate height of the specimen. This condition is, of course, seldom realized in the garden.

In the areas to which they are native, various kinds are found anywhere from sea level to 15,000 feet altitude. Seventy species are native to the Americas, including the well-known cane brake of our southern states. One of their notable characteristics which has made it difficult for botanists to classify them is the fact that, while some may bloom yearly, others grow from 30 to 50 years without blooming and many can be differentiated only by that means. Of the various interesting characteristics, none is more extraordinary than the possible consequence of blooming. One portion of a clump may bloom spasmodically for several years, followed by the dying of such portions, then suddenly the whole plant may burst into bloom, followed by the death of all, including the roots. Strangest of all, specimens of the same species which have been taken to far parts of the world in quite different climates will perform the same way simultaneously, so that there may be nothing left but the resulting seed to perpetuate the species. In consequence of this, a popular belief in certain areas is that in times of great food scarcity, a compassionate deity causes bamboo to flower and yield a harvest of grain, thus saving the people from starvation.

Although we are not here concerned with the

commercial production of bamboo as a raw material for processing into useful items, it is of interest to realize its range of usefulness in that respect. For example, in areas where the larger sorts thrive, a traveling native may make a fire of it to cook his food, cut a section of bamboo culm just above the node to make a receptable for cooking among stones heated by the fire, and use fresh bamboo shoots for his food. Objects which may be made from the wood are almost endless, including such large items as structural timbers, through the familiar range of containers, poles, mats and utensils, to such things as caulking for boats or stuffing for pillows and mattresses as well as to make paper. As an animal feed it contains three to four times as much protein as other grasses and, aside from the asparagus-like shoots which are so well known in oriental cookery, can also be made into candy and pickles. Records of race history written on bamboo tablets strung together at one end like a fan and dug up in A.D. 281 after 600 years of burial contained the history of Tsin from 784 B. C., and incidentally of China for 1500 years before that date.

Since until recent years very little was known hereabouts with respect to bamboos they were for long almost unobtainable in nurseries. Principally through the activities of one supplier, however, quite a few of the better and more varied species have found their way into well-designed gardens the past few years and consequently the demand has increased so that more nurseries are carrying at last one species. The botanical classifications are so complex and confused that nurseries make little attempt to classify them except by common names and potential heights. The tall, woody ones being marketed here belong to the genus *Phyllostachys*. These include giant bamboo, to 40 feet (not necessarily the tallest species for this climate), golden-stemmed bamboo, similar in size and character to the above, black-stemmed bamboo in two distinct forms, to 20 feet, with stems turning slowly from green to brownish black, and a dwarf, green-stemmed bamboo similar in character to the giant species.

Then there is a group classified as *Sasa* after the Japanese name for small. Two of these are to be found, the larger being about five feet tall with pencil-thick stems, with leaves to 12x3 inches, spread on the ends of branches like extended fingers and becomingly named *Sasa palmata*. This is a very striking plant when understandingly grown but must be confined or it may suddenly appear in the middle of the neighbor's garden. There is also a dwarf Sasa which produces a six-to-eight-inch ground cover with leaves sometimes variegated *(S. Veitchii?)*.

A related genus known as *Pseudosasa* is represented by a species *Pseudosasa japonica*, six to eight feet tall with narrow leaves to ten inches.

P. japonica can become exceedingly lush and beautiful in a semi-shady protected spot with other shade-loving plants, such as dwarf skimmia, near by. All bamboos need protection from strong winds, for too much exposure as as well as too much dryness increases the tendency of the leaf edges and tips to die and become straw colored. This is especially noticeable on the larger leafed ones.

One should not be surprised in having difficulty in finding some of those mentioned. Other interesting ones can and will ultimately be grown here. Meanwhile, those mentioned constitute a most interesting and satisfying group to enhance the beauty of our gardens.

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The Arboretum Bulletin

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Notes and Comment

A badly needed revision of the Arboretum's Blooming Calendar has been inserted in the center of this BULLETIN. The new revision will be, we hope, more accurate than the original, since it was made from records kept over a ten-year period. The list is more inclusive since many new plants have been added to our collections or have flowered for the first time in the past seven years. The revision also included a calendar of fall foliage and fruit color which has become an increasingly important part of the Arboretum's display.

THE BULLETIN and the calendar have been stapled separately. By removing the middle staple in the insert the two may easily be separated.

We are having a number of reprints made of the Blooming Calendar which will be available for distribution from the Arboretum office.

* * *

Again this year we will keep the Arboretum office open on Sunday from 10 a.m. to 5 p.m. starting on March 29 and continuing until some time in late June, or as long as the traffic warrants. Mr. Witt, the assistant director, will be on duty.

* * *

The mild weather and early season of this year has brought an unusually large number of visitors to the Arboretum this spring. On Sunday, February 23, our traffic counter registered over a thousand cars passing through. Last February we were unable to obtain a count because of snowy roads.

* * *

The Arboretum was enriched during January by the gift of twenty-three fine plants of rhododendrons from Mr. Endre Ostbo, the well-known nurseryman and rhododendron breeder of Bellevue, Wash., in memory of his late employee and friend, Nick Tomasiello.

Among them are nine of Mr. Ostbo's own hybrids, including "King of Shrubs," "Mrs. Donald Graham" and the recently named "Jane Rogers," "Phyllis Ballard" and "Ed-

ward Dunn" as well as "Loder's White," Loderi "King George" and "Pink Diamond."

Later in the year they will be planted in a new area now being developed well to the north of Rhododendron Glen, thus helping to connect this with the large rhododendron planting west of the magnolia section. A group of such excellent plants, flowering over an extended period, will certainly form an attractive and worthy feature for years to come.

A contribution towards planting expenses was made by Mr. L. Tomasiello of Sydney, Australia.

* * *

Dorothy Lahr, Curator of Education at the Art Museum, will show and comment on slides of Japanese gardens and architecture in Room 120, Smith Hall, University of Washington, at 7 p.m., Thursday, March 20.

There will be no charge for this, courtesy of Mr. and Mrs. Glen Hunt.

* * *

IMPORTANT SPRING DATES . . .
to mark on your calendar!

APRIL 8, 1958 (Tuesday) 7:30 to 9:30 p.m. "Botany for Gardeners." Series II, Educational Program, Room 101 Johnson Hall, U. of W. Campus. (Also April 22, May 13 and May 27.)

APRIL 13, 1958 (Sunday) 11 a.m. to 4 p.m. "Cherry Festival" at Arboretum.

APRIL 16, 1958 (Wednesday) 9:30 a.m. to 2:30 p.m. Work and Fun Day. Our annual Arboretum Clean-up Day. Everyone invited to help!

APRIL 20, 21, 1958 (Sunday and Monday);
APRIL 27, 28, 1958 (Sunday and Monday) 11 a.m. to 4 p.m. Spring series of "Town and Country Garden Tours." Eight beautiful gardens to be visited.

MAY 4, 1958 (Sunday). "Crab Apple Festival" at Arboretum.

Call the Foundation office, EAst 5-4510, for further details.

Fall and Winter Plantings In the Arboretum

(Continued from Page 2)

the old location on the west side of the Boulevard, between Interlaken and Boyer Avenue.

MAPLES. Eight additional plants of different forms of the Japanese *Acer palmatum* have been placed on the hill north of Woodland Garden, while single plants of five other species and three of *Acer nikoense* have been set out nearby. The last had been moved to the nursery a few years ago from the old maple collection west of the Boulevard, where they were too much shaded and not seen by visitors.

MOUNTAIN ASHES *(SORBUS)*. Seven young plants of five species have been moved to the original collection north of the Boulevard, in the Winkenwerder Memorial area. *S. commixta,* native of Japan, and *S. cuspidata* from the Himalayas, are newcomers.

Total plants transplanted in this period, 1042, of 296 kinds. Of all these, approximately 329 plants, or nearly 32 per cent, were new additions to our collections; some 52 different genera are represented among them. The following are examples:

Acer platanoides "Cleveland" and "C. F. Irish"
Camellia japonica "Ella Drayton," "High Hat," "Martha Brice" and "Tina Gilliard"
C. Sasanqua "Crimson King," "Setsugekka" and "Momozono"
Erica mediterranea "W. T. Rackliff"
Fagus sylvatica "Fastigiata," "Spaethii" and "Zlatia"
Forsythia "Lynwood Gold" and "Spring Glory"
Hydrangea Sargentiana, native to central China
Liquidambar orientalis, native of Turkey
Platanus orientalis, Oriental Plane tree
Pyracantha Koidzumii, native to Formosa
Rhododendron prunifolium, a late flowering red azalea from Georgia and Alabama
Tilia Oliveri, native of central China
Viburnum Tinus "French White" and "Purpureum"
Zelkova serrata, Japanese Zelkova or Keaki

ARBORETUM NOTEBOOK

This section is particularly designed for notes, information and queries concerning beautiful or unusual plants from growers of all types or experience. We solicit your remarks and ideas, but space limitations may sometimes restrict us to publishing those of the widest interest.

Garden Hints . . .

APRIL

From an old Herbal

"We all gotta learn and go on learning if we've to do with nature. That's one thing she never stops a teachin' of us."

This year is going to be a bad one so far as garden enemies are concerned. An open winter always complicates work in the garden. Begin early to resist the invading hordes. Most plants are susceptible but especially the Oriental poppies, chrysanthemums, Michaelmas daisies.

April is the magic month to cut back all ivies. Growth comes fast in April and covers up all the bare branches you have left exposed.

Cut off all old blooms of narcissus but not the stems. The leaves may be tied in a loose knot until they disappear.

The verbascums (mulleins) are decidedly plants for dry places. They have developed devices to withstand even direct sun-heat and with their fuzzy, velvety, silver-gray leaves they add an interesting planting to even poor soil and drought. The mulleins have been improved in late years and they are, indeed, "noble plants."

Among the "lesser grown shrubs" one might include *Symphoricarpus orbiculatus,* the Coral Berry or Indian Currant. It is an eastern variety of our Snowberry, *S. rivularis.* I saw a sprig of it in January with burgundy-colored berries closely set along the stem. It was quite charming and an addition to winter bouquets.

A pleasant project for those growing Lenten roses would be naming an outstanding variety and propagating it for the Arboretum sale. The names found in a list of English Lenten roses makes one consumed with curiosity; Black Knight, Faerie Queen, Dora Froebel, are only three of a long list.

Mr. W. J. Bean, who was an eminent authority on magnolias, said, "There is not one magnolia that is not worthy of cultivation." He put *Magnolia stellata* at the head of the list.

MAY

Pruning all flowering shrubs should be attended to directly after flowering. The branches that have flowered should be removed as soon as the flowers have faded. The new, short growths on the Deutzias and Philadelphus should be left to grow for next year's blooming.

We seldom see *Primula denticulata,* and why? It is beautiful, it is easy, it is showy and a trusty friend. Its blooms remind one of a popcorn ball; white, blue (most often blue), purple and sometimes crimson, but always a perfect sphere. It does not like too rich soil but loves to grow in drifts through the shrubs. It grows easily from seed and blooms from early in March into May.

Around the patios of our modern houses boxes of plants seem popular. Cornflowers and godetias can be had in dwarf forms; double varieties of clear pink begonias look well in a box edged with pale blue lobelia. Dwarf conifers are stylish in pots or boxes on the north side of porches. Dwarf veronicas *(V. incana,* to mention only one) are very attractive. Starting with good plants is sound policy.

Have we forgotten the peonies? They are seldom seen in our gardens today. There is a wonderful collection in Olympia in the capitol gardens, quite worthy of a special trip to see them.

There always seems to be a dry spell in May, sometimes long or sometimes short. Trees and shrubs as well as plants need special attention while the dry time lasts.

Apropos of our popular botany classes Donald Culross Peattie has this to say: "There is a mighty Composite family, where social

flowers are united into a city, as snug within their green bracts as ever a medieval fortified town, and divided for different sorts of labor, into various forms, like guilds in their costumes."

JUNE

This is really the month when the rose should take over. The Rose Garden at Woodland Park is worthy of a weekly if not a daily visit in June. Many new varieties appear each year and it is exciting to find one quite to your satisfaction.

It would take too much space to list the fine things in bloom in June, but we have a new "Blooming Calendar" for THE BULLETIN. Digest it.

I think one of my greatest garden pleasures was a small tree of *Abutilon vitifolium*. It was an offshoot from quite a large plant in Mr. Ihrig's garden. It was an erect tree, about eight or nine feet high with handsome, downy, ivy-shaped leaves and the blooms were like small, exquisite, lavender hollyhocks blooming to the tip of the tree. It died one year, after an early frost before the wood had been ripened. Many hardier trees have gone the same way. I should try it again if I had a chance. It was distinctly a tree to be loved and admired, if for only a few years.

Dictamnus albus (Fraxinella) is a handsome plant, always full of health and vigor. It is often called Burning Bush or Gas Plant because of the inflammable resin on the stems. If a lighted match is applied when the flowers are in full bloom, a flame will flash up without injuring the plant. It was often seen in gardens many years ago but seldom nowadays. I know a plant in the San Juan Islands that is three or four feet tall and at least four feet across with rosy-red flowers. Sometimes the flowers are smoky-white, distinctive and unusual.

A list of plants with "neat habits" would seem very usable when one is planting a border or what-ever. So many annuals are so sprawling it is impossible to keep the border neat.

We wonder why violets some years cover themselves with bloom and other years they seem to stop blooming entirely. They have a rule that plants must be divided and moved every third year and they prefer that this operation should be done in June.

Perhaps of all the June flowering shrubs *Viburnum tomentosum Mariesii* is one of the most striking and satisfactory. The branches spread laterally in tiers along which the blossoms are displayed in garlands.

PROPAGATION NOTES

Air layering is a method used to propagate plants that are difficult to increase by other means—plants with rigid branches or stems too high to bend down for ordinary layering and when only a few new plants are wanted.

Here are a few of the many plants you can air layer—maples, dogwoods, crab apples, cherries, viburnums, magnolias, hollies, rhododendrons, deciduous azaleas, wisterias and tree peonies. During May and June is an excellent time to do the work.

To make an air layer select a two- to three-year-old branch. If possible, it should be free of interfering side shoots. Girdle the branch by removing a section of the bark at least as long as the diameter of the stem. Dust the stem with hormone powder and cover with damp sphagnum or green moss. The moss should be like a sponge from which the water has been squeezed. You'll find it easier to apply if you mold it into a ball about the size of a medium grapefruit, then cut it half way through with a sharp knife. Spread the cut sides so as to fit the moss around the girdled section of the branch and fasten it in place with a piece of string.

Cover the moss with polyethylene film. To keep out moisture, the edges of the film should be folded in like you would make a welt or french seam. Tie the film around the center to hold it in place until you tape the ends, top and bottom, with electrical scotch tape. The tape on the upper end should cover the folded film and continue up the stem to make a seal between the branch and the film that will shed water and prevent moisture getting into the moss. If necessary, the layered branch should

be tied into an upright position to allow any excess water to drain out.

Layered branches will develop roots in from five to fourteen months, according to the species. They should not be removed until roots can be seen under the polyethylene film. If removed before winter they should be potted in a sandy compost and placed in a shaded frame. In spring wait until new root action starts before removing the layered branch.

J. A. B.

List of Plant Names

(Continued from Winter, 1957)

tripartitus	three-parted
tripetalus	three-petaled
triphyllus	three-leaved
tripterus	three winged
Tripterygium	Gr., three and wing, referring to fruits
tripunctatus	three spotted
triquetrus	three-cornered
Trisetum	Lat., three and bristles
trispermus	three seeded
tristachyus	three spiked
Tristania	for Jules M. C. Tristan, French botanist
tristis	sad, dull
triternatus	thrice in threes
Triticum	old Latin name for wheat
tritifolium	polished leaves
Tritonia	like a vane or weathercock
triumphans	victorious
Trochodendron	Gr., wheel and tree
trolliifolius	trollius-leaved
Trollius	old German trol, something round
Tropaeolum	from Gr. tropaion, trophy
tropicus	of the tropics
truncatus	truncate, cut off square
tsangpoense	from the Tsangpo River, Tibet
tsariense	from Tsari, Tibet
tsarongense	from Tsarong, Tibet
Tschonoskii	for Tschonoski, a Japanese collector
Tsuga	Japanese name
tubaeformis, tubatus	trumpet-shaped
tuberculatus	having small knobs
tuberosus	producing tubers
tubifera	tube-bearing
tubiflorus	with tubular flowers
tubispathus	tube-like spathe
tubulosus	like a tube
Tulipa	from Persian toliban or tulbend, a turban
tulipifera	tulip-bearing
tumidus	swollen
Tunica	Lat., a tunic or coat
turbinatus	top-shaped
turbinellus	small top-shaped
turgidus	turgid, inflated
Tussilago	Lat. tussis, cough
Tutcheria	for W. J. Tutcher, Hong Kong
Typha	ancient Gr. name
typhinus	pertaining to fever
typicus	typical

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BOOK REVIEWS

The Rhododendron and Camellia Yearbook, 1958. No. 12. Royal Horticultural Society, Westminster, London, S.W.1, (1957) Price $1.65 incl. postage.

THE Rhododendron and Camellia Yearbook, 1958, of the R.H.S. has been distributed and contains a number of very interesting articles.

The foremost is a brief history of the Rhododendron Society, founded in 1915, with a list of the original members, most of whom are well known to those interested in Rhododendron culture.

In addition to the names with which most of us are familiar, there are mentioned other pioneers of Rhododendron breeding and culture whose mark is still very influential. Some of them are: Anthony Waterer, Anderson-Henry of Edinburgh, and H. J. Mangles in particular, some of whose hybrids are among the best garden shrubs today.

I have a number of old volumes of the *Journal of Horticulture*, published in the 1880's, where Mangles gives details of some of the Rhododendron crosses he made and bloomed. I will mention only three: *ponticum* x *Griffithianum* (now named 'Loder's White,' because it was acquired by Sir Edmund Loder); *campanulatum* x *Griffithianum* ('Beauty of Littleworth'); and *ponticum* x (Azalea) *luteum*, ('Glory of Littleworth'). 'Loder's White' in particular has been mentioned numerous times as the best garden rhododendron in existence.

There is a well-illustrated article on Col. J. I. Horlick's "Gardens on the Isle of Gigha," by P. M. Synge; also one on "Westbourn," by Lanning Roper.

"Ghent Azaleas," by Donald Waterer, names and describes some of the older but still very worthwhile azaleas.

"Rhododendrons and Camellias at Pylewell Park," also by P. M. Synge, has been illustrated with some beautiful photographs of old and large rhododendrons in a mild climate in the south of England.

Of particular interest to all of us who live in the Northwest is the article on the November 1955 freeze, the events leading up to it, and the immediate damage and the after effects. The author, Harry R. Madison, has carefully tabulated all the temperatures, rainfall and other phenomena of that disastrous year.

The article on the Rhododendron Show, 1957, by P. M. Synge, is illustrated by an attractive colored plate, but I think one or two closer views, giving more detail, would have been appreciated. There are short articles on the Scottish Rhododendron Show, 1957, by Dr. J. M. Cowan, on the Seattle Rhododendron Show and on the Tacoma Rhododendron Show.

There is a list of awards to camellias and rhododendrons, articles on "Camellias in California," by Sir Giles Loder; "Camellias in Virginia," by Frederic Heutte; "Camellias in New Zealand"; an article on the "Confusion in Camellia Nomenclature," by Charles Puddle, and a description of the Camellia Show and Competition held in London in April, 1957.

Two books, *The Camellia*, edited by Beryl Leslie Urquhart, and *Rhododendrons 1956*, published by the American Rhododendron Society, are reviewed.

The names of the members of the Rhododendron and Camellia Committee for 1957 are included.

The book is well illustrated with 51 black and white photographs, as well as a colored frontispiece of *R. cinnabarinum Roylei*, and of the Rhododendron Show in color mentioned above.

L. E. B.

* * *

The Hundred Finest Trees and Shrubs for Temperate Climates. Plants & Gardens, Brooklyn Botanic Garden Record, Autumn, 1957. Price $1.00.

THIS little paperbound handbook is another of the very fine and useful series being published by the Brooklyn Botanic Garden. In it, as the title indicates, they have attempted to chose the hundred best trees and shrubs for temperate North America. Considering the tremendous amount of plant material available, those responsible for the final selection of the hundred have compiled a very impressive and useful list. The plants are divided, alphabetically by scientific name, into a section on trees and another on shrubs. Each selection is described briefly but adequately, in short paragraphs on Outstanding Features, Habit and Use, Hardiness, Culture, and Varieties or Kinds. The information included is well designed to stimulate interest in the particular plant being described.

As might be imagined in a work of this type, which is expected to cover a continent, many fine plants were omitted. The Californian may ask, where are the Eucalyptus? The North Dakotan, where are the Caraganas? There does seem to be an imbalance in some of the choices, however. Four viburnums have been included and not one juniper; three euonymus and only one daphne; both of the sequoia species, but not a single true fir or chamaecyparis. From the point of view of the Pacific Coast the list is very deficient, ignoring the manzanitas, the ceanothus and many other fine trees and shrubs commonly grown here, yet at the same time including such comparatively rare plants as the golden larch, *Pseudolarix amabilis*, and the dawn redwood, *Metasequoia glyptostroboides*.

Nevertheless, when one considers the herculean task that must have gone into sorting out the present list, one can feel that the few errors and apparent omissions are completely overbalanced by the fine end results. Incidentally, one should be sure to read Dr. G. S. Avery's introductory remarks before even opening to the first selections as they are designed to allay the wrath of those whose favorites have been overlooked.

J. A. W.

* * *

Camellias Illustrated. Revised and enlarged edition; edited by Morrie L. Sharp, sponsored by Oregon Camellia Society. (Portland, Oregon, 1957.) Price $5.00.

CAMELLIAS ILLUSTRATED was first published in 1948 for the camellia fancier. It covers all of the phases of camellia lore in a

clear, concise manner. Two hundred seventy-six black-and-white and ninety-eight colored photographs are used to illustrate the species; *japonica, sasanqua, reticulata,* hybrids and numerous varieties.

Directions for planting and outdoor and greenhouse culture are fully covered, along with a discussion of pests and diseases and their cures. Illustrated directions give detailed information for propagating by means of seeds, leaf cuttings, stem cuttings, grafting and air layering. The making of corsages and the use of camellias in flower arrangements is clearly demonstrated.

Between the covers of this book the camellia addict can find the answers to most of his questions about his particular hobby—growing fine camellias.

H. G. B.

* * *

Exotic Forest Trees in Great Britain. Forestry Commission Bulletin No. 30. Edited by James MacDonald, R. F. Wood, M. V. Edwards and J. R. Aldhaus, Her Majesty's Stationery Office, London, 1957. Price 17 shillings and sixpence ($2.45).

IT IS ALWAYS interesting to meet old friends in unfamiliar surroundings and in this publication we have the pleasure of observing many familiar trees in a foreign environment—The British Isles. Illustrated by a number of excellent photographs one finds descriptions of such native Northwestern conifers as Pacific silver, white, alpine, grand and noble fir, Alaska yellow cedar, western larch, Engelmann and Sitka spruce, lodgepole and ponderosa pine, western red cedar and western and mountain hemlocks. Among descriptions of broadleaved trees is the familiar big leaf maple. Numerous other conifers and broadleaves are also described and illustrated.

The first portion of this publication treats the reasons for extensive introductions of trees exotic to the British Isles, as well as with the history of many of these introductions, and the relationship of these species to the British forestry program.

This book is an outgrowth of a recommendation, following the Sixth Commonwealth Forestry Conference which met in Canada in 1952, for a detailed account of the use of exotic species in the British Commonwealth; it represents the response of Great Britain to this recommendation.

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The Shrubby Penstemons

(Continued from Page 9)

or treatment in ordinary garden soils, but benefit from a mulching with pine needles. *Fruticosus,* at least, blooms better and remains more compact if the plants are sheared just after blooming. Old plants which tend to die out in the center or become leggy may be rehabilitated by filling in the center with soil or sphagnum. Diseases and pests are not a problem, though occasional plants may die suddenly for no apparent reason. One such that I examined had rotted at the ground line, whether from injury or poor drainage I do not know. In some regions the evergreen foliage tends to "burn" in the winter time if not protected from drying winds. *Newberryi* is reported as somewhat given to dying after blooming for reasons undetermined; others report it as easy and long lived.

New plants can be started easily from cuttings. One may break off rooted pieces from

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the main plants, as they have a tendency to root themselves where they touch the ground. Plants may also be raised from seed sown on top of the soil, outdoors, to catch the last month or so of winter freezing; they should bloom the second or third year. Interesting variations can be obtained from seed, particularly if several species are grown close together, as hybridization is likely to occur.

Unfortunately for those who would like to grow shrubby Penstemons in their gardens, only a few of the species and clones are available commercially in the Northwest at the present time, and considerable shopping around may be necessary to locate them. However, through the efforts of the American Penstemon Society, interest in all types for the garden is increasing, and we can look forward to finding more of these interesting plants offered for sale. Northwesterners, with the mountains close at hand, are fortunate in being able to collect their own seeds and cuttings.

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Hamamelidaceae

(Continued from Page 6)

pretty shrub is not dependably hardy. It may be grown outside in summer and wintered in an unheated greenhouse where it displays its white witch-hazel-like blossoms.

Distylium racemosum. A Japanese evergreen shrub (a tree in Japan) of 5 to 6 feet, rather stiff, with rigid short branches. The flowers, in April and May, are borne on slender racemes, without petals, having a 5-parted red calyx with several reddish purple stamens. The leaves are leathery, thick, alternate, ovate, shining deep green. This shrub is curious rather than beautiful. Its nearest ally is Sycopsis.

Sycopsis sinensis (from *Sykos,* fig, and *opsis,* likeness to.) A hardy evergreen bushy shrub or small tree, from China, up to 20 feet. The leaves are elliptical, leathery, dark green. The flowers, in small dense clusters less than an inch long, are without petals. The ten yellow stamens are enclosed by reddish brown bracts. These inconspicuous blossoms appear in February or March. This evergreen shrub is neat and of distinct appearance, but not showy. It is a useful but not indispensable garden subject.

Parrotia persica, a hardy deciduous tree to 40 feet with smooth gray bark which peels in flakes like the plane tree. The lower branches should be pruned back sharply when young, otherwise this tree is apt to remain stunted. The flowers, without petals, appear in March. Although the flowers themselves are insignificant the clusters of red stamens are

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conspicuous and are supported by brown and green hairy bracts on the leafless branches, giving a hazy red effect. The chief beauty of this tree is its handsome yellow, orange and crimson, beech-like autumn foliage which remains in beauty a long time. Few trees are more brilliant in this autumn phase.

Parrotiopsis Jacquemontiana, a related hardy deciduous tree to 20 feet with a smooth gray trunk. Although the blossoms, which are produced from April to July, are without petals, the numerous yellow stamens are surrounded by conspicuous petal-like white bracts, after the manner of our native dogwood, and are the chief feature of the inflorescence, which is two inches across. This is not a particularly showy plant, but is pretty when well furnished with flower heads. Its orange autumn coloring is very fine.

Sinowilsonia Henryi, a Chinese deciduous shrub or small tree to 25 feet or more. The inconspicuous flowers are without petals, greenish, in slender terminal pendulous racemes about 3 inches long, and have no real beauty. The leaves are large and linden-like. The shrub itself is of only mild interest.

Disanthus cercidifolius comes from the high mountains of central Japan and demands, like so many in the hamamelis group, a light peaty soil such as that in which the heaths flourish. As the name implies the leaves are like the Redbud. This species is a hardy deciduous ornamental shrub to ten feet, of elegant habit with distinct and handsome foliage turning in autumn to one of the loveliest of claret-reds suffused with orange. The small flowers appear in October, about the time of leaf-fall, and are borne in pairs; the petals are narrow, purple in color.

In the Arboretum the Hamamelis family will be found on the east side of Arboretum Drive, across the road from the holly collection. It is particularly interesting in late winter and early spring, the flowering season, and again for leaf colors in October and early November.

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American Primulas

(Continued from Page 17)

many years ago and it was impossible to guess its original color. It has been described as pale pink or bluish with a conspicuous orange eye. The flower stem was three inches or longer and the leaves were one-half inch long, pale green above and more or less mealy beneath. This specimen was collected in the Canadian Rockies on Bear Creek which, apparently, by the inscription, is in Saskatchewan.

Cuneifolia Section

P. CUNEIFOLIA. This is a cunning and choice little species called "Pixie Eyes" in Alaska. It grows in Eastern Sibéria, on the islands in the Bering Straits, as far south as Juneau and Seward where there is a white form. It forms a tuft of smooth leaves, which are one-fourth to three-fourths inches long, wedge-shaped and notched at the top, with no meal. My first impression on seeing it in the herbarium was its likeness to *P. minima,* but the leaves are not square across the top. It has an umbel of from one to six rose-colored flowers on a stem four to five inches long. Growing in the Arctic it is naturally hardy and in the garden will generally flourish in gritty fibrous loam, in a moist, open spot. Mr.

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Walter Eyerdam, in an article in "Little Gardens," says it is a very variable species in size and character of the leaves and flowers. He reports it growing in alpine meadows where the ground is still damp from melted snow.

P. SUFFRUTESCENS. High in the Sierra Nevada Mountains of California, the mountain climber may meet a little shrub-like, partly prostrate plant with dense tufts of leaves growing in rosettes at the end of stout, woody stems. The leaves are leathery in texture, like a wedge in shape, smooth, with no meal, and notched at the top with from four to seven sharp teeth. If found in June or July there may be an umbel of clear pink flowers with yellow eyes topping a stem from two to five inches high. Undoubtedly this is *P. suffrutescens,* which has been more or less of a puzzle to primula growers since 1884 when it was introduced into cultivation. It belongs to the *Cuneifolia* section, a group fairly closely related to the *Farinosae* section. A grower on Vancouver Island grew *P. suffrutescens* for twelve years in an alpine house as it does not like our wet winters. It seeds sparingly but may be propagated by cuttings.

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Moist, bright and green, the landscape laughs around.—*James Thomson*

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Newer Hybrid Lilies

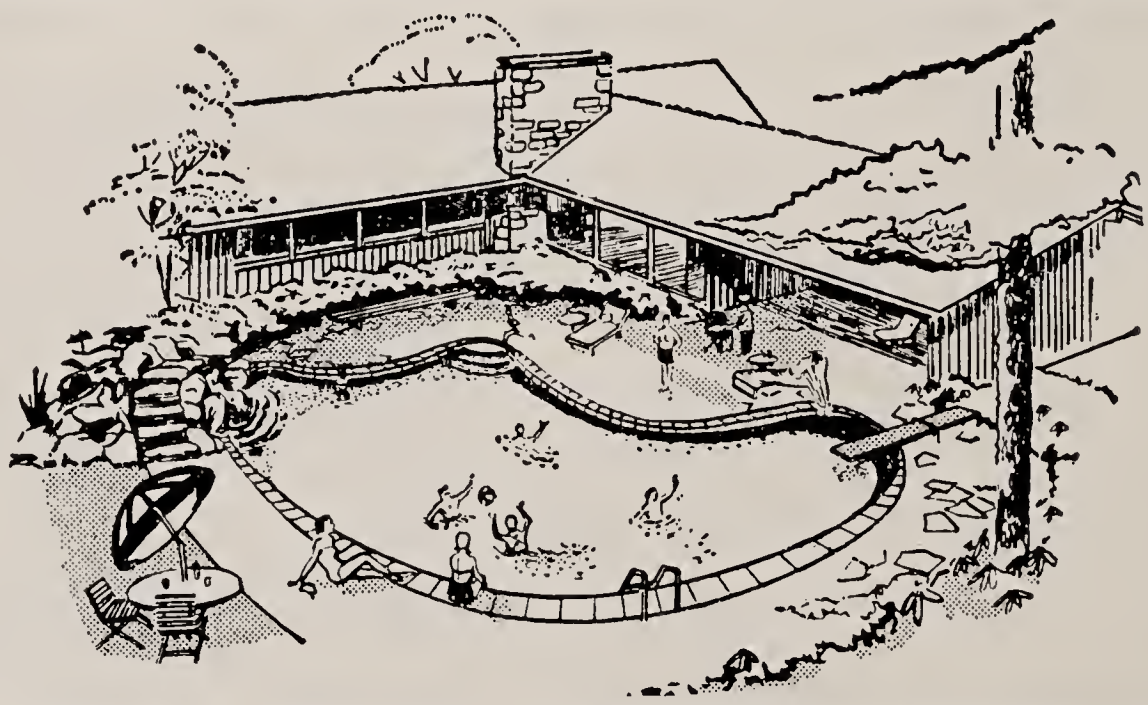
(Continued from Page 14)

Dr. C. F. Patterson, at the University of Saskatchewan, used *L. cernuum,* a small, hardy, lilac-pink species from Korea and Manchuria, to produce hybrids for his rigorous climate. I prefer his "Edith Cecilia," "Lemon Queen" and "White Princess," but there are several others that you who must grow your lilies in a cold climate might do well to try.

Percy Byam has given us "Dark Eyes" and "Ruby," both grand low-growing reds, as well as two taller yellows, "Melody" and "Symphony," which trace to the Stenographer hybrids.

Dr. F. L. Skinner of Manitoba has originated many lilies other than those of the *Martagon-Hansonii* group mentioned above. His "Duchess," "Helen Carroll" and "Lemon Lady" are good, easily-grown yellows.

Despite the great interest in pink trumpet lilies, I have avoided the subject. There are several strains and a few clones on the market,



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but not all are satisfactory. Some are not pink and others do not stay pink. I make no recommendations but wish to state that some excellent pink trumpet lilies were at the 1957 shows and will soon be obtainable. You will enjoy them. Both of our pink trumpet species *(L. japonicum* and *L. rubellum)* are a little difficult but some of the new hybrid pink trumpets that I saw last summer are far superior to either. Edgar Kline's Cameo hybrids *(L. auratum* x *L. japonicum)* should be available next year. They are good.

There are many more new hybrids that I should describe and some very capable hybridizers whom I should mention but the limitations of space must be observed.

I must tell, however, about the triploid lilies produced by the U. S. Dept. of Agriculture. By shock treatment the number of chromosomes is increased from 24 to 36. The resulting plants are about fifty percent larger with proportionate increase in vigor, substance and hardiness. I have seen only the Easter lily so treated but if the same simple methods will apply to the many other species and hybrids in cultivation we will be amazed at the new lily forms that will appear in the near future.

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Bog Gardens

(Continued from Page 11)

nary rhubarb but a close relative; *Saxifraga peltata maxima,* also known as *Peltiphyllum peltatum; Fatsia japonica, Gunnera dentata, Acanthus spinosus* or Bear's Breeches, and *Oplopanax horridum,* mentioned previously and justifiably known as Devil's Club by reason of the closely crowded spines on the stems. Clumps of Bamboo might be used with these plants.

Sufficient space must be allotted to such a section of the bog garden to get the full effect from the bulkiness of the plants and the large scale of the leaves. Nor will they be good associates for some types of smaller plants which they might overshadow. Scale becomes as important here as elsewhere even though it is not within the province of this article to treat it. We can only admonish those covetous gardeners who want to grow "some of everything" that they give some thought, when planting a bog, to the old adage about "a place for everything and everything in its place."

We must acknowledge, also, the gradations of moisture in a bog garden no matter how we choose to classify them. Shallow, deep, very deep; or light, medium, heavy; the words do not matter as long as we accept the fact that we must consider the degree of bogginess present when selecting plants. One must recognize that Skunk Cabbage *(Symplocarpus foetidus)* tolerates wet feet to a greater extent than does little *Primula rosea grandiflora. Taxodium distichum,* the interesting and beautiful Swamp Cypress from the south, thrives in water-saturated soil. *Rhamnus Purshiana* only tolerates nothing more than a moderate amount of moisture. Yet the latter as well as the former might be introduced into a bog garden.

Oddities which grow in swampy ground may appeal to some people. There are among these some carnivorous plants such as Sundew *(Drosera),* Pitcherplant *(Sarracenia),* and Cobra or California Pitcher Plant *(Darlingtonia californica).* Though difficult to obtain,

the sundews may be grown from seed.

A visit to the University of Washington Arboretum will open the way to closer acquaintance with some of the unusual plants which might grace a bog garden. Here are a few to be seen there: *Azalea canescens, Azalea Vaseyi, Azalea viscosa*—by far the most adaptable to wet places, *Rhodora canadensis, Andromeda polifolia, Leucothoe Catesbaei, Erica Tetralix, Vaccinium corymbosum* and others, *Kalmia angustifolia, Cornus alba, Cornus sanguinea, Ledum columbianum,* hollies such as *Ilex glabra*—the Inkberry—and *Ilex verticillata,* the scented shrub *Myrica Gale* or Bog Myrtle, and various willows.

Some spectacular natural bogs offer ideas, too. Engraven on my mind is a vivid picture painted by acres of *Lythrum Salicaria,* purple loosestrife, toes in water along a lake marge, the myriad stalks topped by red-purple spikes. Even cat-tails, *Typha latifolia,* in masses, have captured my attention, especially if red-winged blackbirds were lighting and perching among them, with their occasional sharp "Oak-a-lee-ker" piercing the autumn calmness. How often, also, I have revelled in the display of the fairly subdued rose-colored feathery flowers of Steeplebush or Hardhack *(Spiraea Douglasii)* as their 4-to-6-foot thickets invaded unimproved lakes.

The plants herewith named are intended to serve more as an index in the investigation of which a book-length list of references might be compiled. Ingenuity and imagination will suggest adaptations of known plans of bog plantings. Actual situations will further vary the appearance of any new plan being considered. Start with other people's ideas in bog gardening as in other endeavors, but pursue them in your own way and you will soon outstrip designs passed on to you and will create something new and original. Your bog garden will be valuable to you as well as to those who visit it because it is your own. Research, followed by careful planning on paper, followed in turn by thoughtful selection of material, will be rewarded by success measured in terms of maintenance-free enjoyment.

Bibliography

Credit for assistance with this article is due many gardening friends who have been good enough to discuss the subject with me, and to Mr. Mulligan, director of the Arboretum, for a list of plants to be found there. A full bibliography would be too lengthy for inclusion since only a fraction of the material in each source is pertinent to the topic. Commercial catalogues, various encyclopedias and dictionaries of gardening, as well as numerous periodicals have been consulted.

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"GARDENING FAIR"

Frederick & Nelson, Bellevue

Again Prentice Nursery shrubs have been chosen for Frederick & Nelson's "Gardening Fair," March 19, 20, 21 and 22 at Bellevue. These plants are fine, selected specimens . . . the same varieties used in distinctive Prentice landscaping projects. They will be displayed on the outdoor terrace during the Fair. Demonstrators and garden authorities will be on hand to answer questions.

select from these varieties:

- *Named variety Rhododendrons*
- *Evergreen Azaleas*
- *Exbury Azaleas*
- *Azalea Schlippenbachii*
- *Gable Azaleas*
- *Andromeda japonica*
- *Oxydendrons*
- *Flowering Cherry*
- *Flowering Crab*
- *Pink Dogwood*
- *Ilex bullata*
- *Pine*
- *Magnolia stellata*
- *Maple*
- *Junipers: Tams Pfitzers compacta*
- *Enkianthus*
- *Heather*
- *Japanese Maple*
- *Fatsia japonica*
- *Rockery Plants*

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Also evergreen and deciduous Magnolias in many choice varieties, all sizes.

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